



1/28

SEQUENCE LISTING

<110> Abbott Laboratories
Mukerji, Pradip
Huang, Yung-Sheng
Pereira, Suzette L.

<120> DESATURASE GENES, ENZYMES ENCODED
THEREBY, AND USES THEREOF

<130> 6884.US.O

<140> 10/060,793

<141> 2002-01-30

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<223> r = g or a at positions 30-31

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<211> 358

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<213> Saprolegnia diclina

<400> 26

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Leu Tyr Tyr Thr Ala Arg Ala Ile Phe Asn Ala Ser Ala Ser Ala Ala						
35	40	45				
Leu Leu Tyr Ala Ala Arg Ser Thr Pro Phe Ile Ala Asp Asn Val Leu						
50	55	60				
Leu His Ala Leu Val Cys Ala Thr Tyr Ile Tyr Val Gln Gly Val Ile						
65	70	75	80			
Phe Trp Gly Phe Phe Thr Val Gly His Asp Cys Gly His Ser Ala Phe						
85	90	95				
Ser Arg Tyr His Ser Val Asn Phe Ile Ile Gly Cys Ile Met His Ser						
100	105	110				
Ala Ile Leu Thr Pro Phe Glu Ser Trp Arg Val Thr His Arg His His						
115	120	125				
His Lys Asn Thr Gly Asn Ile Asp Lys Asp Glu Ile Phe Tyr Pro His						
130	135	140				
Arg Ser Val Lys Asp Leu Gln Asp Val Arg Gln Trp Val Tyr Thr Leu						
145	150	155	160			
Gly Gly Ala Trp Phe Val Tyr Leu Lys Val Gly Tyr Ala Pro Arg Thr						
165	170	175				
Met Ser His Phe Asp Pro Trp Asp Pro Leu Leu Arg Arg Ala Ser						
180	185	190				
Ala Val Ile Val Ser Leu Gly Val Trp Ala Ala Phe Phe Ala Ala Tyr						
195	200	205				
Ala Tyr Leu Thr Tyr Ser Leu Gly Phe Ala Val Met Gly Leu Tyr Tyr						
210	215	220				
Tyr Ala Pro Leu Phe Val Phe Ala Ser Phe Leu Val Ile Thr Thr Phe						
225	230	235	240			
Leu His His Asn Asp Glu Ala Thr Pro Trp Tyr Gly Asp Ser Glu Trp						
245	250	255				
Thr Tyr Val Lys Gly Asn Leu Ser Ser Val Asp Arg Ser Tyr Gly Ala						
260	265	270				
Phe Val Asp Asn Leu Ser His His Ile Gly Thr His Gln Val His His						
275	280	285				
Leu Phe Pro Ile Ile Pro His Tyr Lys Leu Asn Glu Ala Thr Lys His						
290	295	300				

Phe Ala Ala Ala Tyr Pro His Leu Val Arg Arg Asn Asp Glu Pro Ile
 305 310 315 320
 Ile Thr Ala Phe Phe Lys Thr Ala His Leu Phe Val Asn Tyr Gly Ala
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 340 345 350
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<212> DNA

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ccggcgtcg	cgcccatcat	cgtcgcacac	tgcggatgt	acaacatcaa	gtacgcatac	1320
tttgcggact	ttacggccgc	cggtgtgtc	cacttggaa	acccatccaa	catggccca	1380
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<212> DNA

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ttcgactt	ccttgatcat	gtgcgtgg	accatccgc	aggatctatct	cgaggatoc	300
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gcccattgt	gggtatccgc	caatgtcg	ccaggatgg	atgcgtactt	ttcgtgtatc	540
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gggttgcgt	agccatcaa	ggccgtacatc	accatccctc	agatgcacca	gttcatggca	660

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35 40 45	
Leu Ala Ala Gly Lys Glu Ala Thr Ile Leu Phe Glu Thr Tyr His Ile	
50 55 60	
Lys Gly Val Pro Asp Ala Val Leu Arg Lys Tyr Lys Val Gly Lys Leu	
65 70 75 80	
Pro Gln Gly Lys Gly Glu Thr Ser His Met Pro Thr Gly Leu Asp	
85 90 95	
Ser Ala Ser Tyr Tyr Ser Trp Asp Ser Glu Phe Tyr Arg Val Leu Arg	
100 105 110	
Glu Arg Val Ala Lys Lys Leu Ala Glu Pro Gly Leu Met Gln Arg Ala	
115 120 125	
Arg Met Glu Leu Trp Ala Lys Ala Ile Phe Leu Leu Ala Gly Phe Trp	
130 135 140	
Gly Ser Leu Tyr Ala Met Cys Val Leu Asp Pro His Gly Gly Ala Met	
145 150 155 160	
Val Ala Ala Val Thr Leu Gly Val Phe Ala Ala Phe Val Gly Thr Cys	
165 170 175	
Ile Gln His Asp Gly Ser His Gly Ala Phe Ser Lys Ser Arg Phe Met	
180 185 190	
Asn Lys Ala Ala Gly Trp Thr Leu Asp Met Ile Gly Ala Ser Ala Met	
195 200 205	
Thr Trp Glu Met Gln His Val Leu Gly His His Pro Tyr Thr Asn Leu	
210 215 220	
Ile Glu Met Glu Asn Gly Leu Ala Lys Val Lys Gly Ala Asp Val Asp	
225 230 235 240	
Pro Lys Lys Val Asp Gln Glu Ser Asp Pro Asp Val Phe Ser Thr Tyr	
245 250 255	
Pro Met Leu Arg Leu His Pro Trp His Arg Gln Arg Phe Tyr His Lys	
260 265 270	
Phe Gln His Leu Tyr Ala Pro Leu Ile Phe Gly Met Thr Ile Asn	
275 280 285	
Lys Val Ile Ser Gln Asp Val Gly Val Val Leu Arg Lys Arg Leu Phe	
290 295 300	
Gln Ile Asp Ala Asn Cys Arg Tyr Gly Ser Pro Trp Asn Val Ala Arg	
305 310 315 320	
Pho Trp Ile Met Lys Leu Leu Thr Thr Leu Tyr Met Val Ala Leu Pro	
325 330 335	
Met Tyr Met Gln Gly Pro Ala Gln Gly Leu Lys Leu Phe Phe Met Ala	
340 345 350	
His Phe Thr Cys Gly Glu Val Leu Ala Thr Met Phe Ile Val Asn His	
355 360 365	
Ile Ile Glu Gly Val Ser Tyr Ala Ser Lys Asp Ala Val Lys Gly Val	

370	375	380
Met Ala Pro Pro Arg	Thr Val His Gly Val	Thr Pro Met Gln Val Thr
385	390	395
Gln Lys Ala Leu Ser Ala Ala Glu Ser Thr	Lys Ser Asp Ala Asp Lys	400
405	410	415
Thr Thr Met Ile Pro Leu Asn Asp Trp Ala Ala Val	Gln Cys Gln Thr	
420	425	430
Ser Val Asn Trp Ala Val Gly Ser Trp Phe Trp Asn His	Phe Ser Gly	
435	440	445
Gly Leu Asn His Gln Ile Glu His His Cys Phe Pro Gln Asn Pro His		
450	455	460
Thr Val Asn Val Tyr Ile Ser Gly Ile Val	Lys Glu Thr Cys Glu Glu	
465	470	475
Tyr Gly Val Pro Tyr Gln Ala Glu Ile Ser Leu Phe Ser Ala Tyr Phe		480
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<223> k = g or t/u at position 31

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51

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<221> misc_feature <222> (31)...(31) <223> k = g or t/u at position 31	
<221> misc_feature <222> (33)...(33) <223> y = t/u or c at position 33	
<221> misc_feature <222> (36)...(36) <223> s = g or c at position 36	
<400> 33 ccsstctact ggatcrysca gggtrtcgtc kgyacsggtg tctgg	45
<210> 34 <211> 45 <212> DNA <213> Artificial Sequence	
<220> <223> Reverse Primer R0966	
<221> misc_feature <222> (19)...(19) <223> s = g or c at position 19	

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<221> misc_feature
<222> (20)...(21)
<223> m = a or c at positions 20-21

<221> misc_feature
<222> (30)...(30)
<223> r = g or a at position 30

<400> 34
ggcgtaggt tgccatm mcgagaagar gtggggcg acgtg 45

<210> 35
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Forward Primer R0975

<400> 35
cacgtaccc cagcacacgg acacctacg 29

<210> 36
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Forward Primer R0976

<400> 36
gatcgacagg gcgatccacc acattgc 27

<210> 37
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Reverse Primer R0977

<400> 37
caaatgtta aagcttagtgg cagcgtgc 29

<210> 38
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Reverse Primer R0978

<400> 38
agtacgtgcc ctggacgaac cagtagatg 29

<210> 39

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<211> 48
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Forward Primer R01051

 <400> 39
 tcaacagaat tcatgtgcaa aggtcaagct ctttccaagg ccgacgtg 48

 <210> 40
 <211> 48
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Reverse Primer R01057

 <400> 40
 aaaagaaaaac ttactttt cctcgagctt gcgcattgtaa aacacaac 48

 <210> 41
 <211> 1182
 <212> DNA
 <213> Saprolegnia diclina

 <400> 41
 atgtgcaag gtcaagtc ttccaaaggcc gacgtgttcc acgctgcggg gtaccggccg 60
 gtccgcggc cgccccggcc gtcgcgcgtg gagccccgg caatcacgtt caaggacct 120
 cgcgcggcgtt tccggccca ctgttttag gtcgcgcgtg caatagttt ttaccatttg 180
 gccaagaatc ttgcgcgttgc cggccgttg ttcgcgttgc gcttcacgtt cgcggctgcc 240
 gacttgcgc tcgcggccaa gtcggcgtcg gtcgcgttgc ctatgttgcg ccagggcacg 300
 tactttacgg gatctcggtt cattggcac gaatggggcc accaggcggtt ctcgccgtcc 360
 gagatcccta acgacacggc cggatattt ctatcactgcg ttcgttgcg gtcgttaccac 420
 agtggaaatc tcaaggcccg ccggccacac tccaaacacgg gacgtgtcgaa gaacgcacqag 480
 gtgtttacgc cgacggccgcg gtccgtcgcc gaggccaaacg acgaccactc gtccttcgaa 540
 gagacccgcg ttatcacatc gtacggatgc gtcatgttgc ttctcggtgg ctggatgcgg 600
 ggcttacccct ttcataacgcg gacggccccc accaaatgcg ctggccgtcg caatgtcgac 660
 ttcaaccctgtt acgcacgcctt ttccatccca aaggagcgcc tcaatgttgc gtcggatgcac 720
 ctctgttcc tcgcggccctt gtacggcttt ggatcgccg ttcgttgcg ttcgttgccttc 780
 gatgtccgc ccactatcatc ctgtccgttccatgttgc acgatgttgc ctgttgccttc 840
 acgtatccctt acgacacggc ttcgttgcgtt ccggccacgca gtggaaactgg 900
 ctgcgcggcg cgtctgcac ttcgttgcgtt ccggccacgca gtggatgcg cagcgcgtac 960
 caccatcg ccgacacgcg cgttgcgttccatgttgc ccaagacgcg ctgttaccac 1020
 gcgatcgagg cgacccacgcg catcaacccc ctccctcgca agtactactt catcgaccccg 1080
 acgcgcgttcc cgttgcgttccatgttgc ctcacgttgc acgtatgttgc gaggacgcac 1140
 ggcaacgtt tgtttacaa gtcgttgcgtt ccggccacgca gaggaaatg aa 1182

 <210> 42
 <211> 393
 <212> PRT
 <213> Saprolegnia diclina

 <400> 42
 Met Cys Lys Gly Gln Ala Pro Ser Lys Ala Asp Val Phe His Ala Ala
 1 5 10 15
 Gly Tyr Arg Pro Val Ala Gly Thr Pro Glu Pro Leu Pro Leu Glu Pro

20	25	30
Pro Thr Ile Thr Leu Lys Asp	Leu Arg Ala Ala Ala	Ile Pro Ala His Cys
35	40	45
Phe Glu Arg Ser Ala Ala Thr	Ser Phe Tyr His Leu Ala Lys Asn Leu	
50	55	60
Ala Ile Cys Ala Gly Val	Phe Ala Val Gly Leu Lys Leu Ala Ala Ala	
65	70	75
Asp Leu Pro Leu Ala Ala Lys	Leu Val Ala Trp Pro Ile Tyr Trp Phe	
85	90	95
Val Gln Gly Thr Tyr Phe Thr	Gly Ile Trp Val Ile Ala His Glu Cys	
100	105	110
Gly His Gln Ala Phe Ser Ala	Ser Glu Ile Leu Asn Asp Thr Val Gly	
115	120	125
Ile Ile Leu His Ser Leu Leu	Phe Val Pro Tyr His Ser Trp Lys Ile	
130	135	140
Thr His Arg Arg His His Ser	Asn Thr Gly Ser Cys Glu Asn Asp Glu	
145	150	155
Val Phe Thr Pro Thr Pro Arg	Ser Val Val Glu Ala Lys His Asp His	
165	170	175
Ser Leu Leu Glu Glu Ser Pro	Leu Tyr Asn Leu Tyr Gly Ile Val Met	
180	185	190
Met Leu Leu Val Gly Trp Met	Pro Gly Tyr Leu Phe Phe Asn Ala Thr	
195	200	205
Gly Pro Thr Lys Tyr Ala Gly	Leu Ala Lys Ser His Phe Asn Pro Tyr	
210	215	220
Ala Ala Phe Phe Leu Pro Lys	Glu Arg Leu Ser Ile Trp Trp Ser Asp	
225	230	235
Leu Cys Phe Leu Ala Ala Leu	Tyr Gly Phe Gly Tyr Gly Val Ser Val	
245	250	255
Phe Gly Leu Leu Asp Val Ala Arg	His Tyr Ile Val Pro Tyr Leu Ile	
260	265	270
Cys Asn Ala Tyr Leu Val Leu	Ile Thr Tyr Leu Gln His Thr Asp Thr	
275	280	285
Tyr Val Pro His Phe Arg	Gly Asp Glu Trp Asn Trp Leu Arg Gly Ala	
290	295	300
Leu Cys Thr Val Asp Arg Ser	Phe Gly Ala Trp Ile Asp Ser Ala Ile	
305	310	315
His His Ile Ala Asp Thr His	Val Thr His His Ile Phe Ser Lys Thr	
325	330	335
Pro Phe Tyr His Ala Ile Glu	Ala Thr Asp Ala Ile Thr Pro Leu Leu	
340	345	350
Gly Lys Tyr Tyr Leu Ile Asp	Pro Thr Pro Ile Pro Ala Leu Leu Trp	
355	360	365
Arg Ser Phe Thr His Cys Lys	Tyr Val Glu Asp Asp Gly Asn Val Val	
370	375	380
Phe Tyr Lys Arg Lys Leu Glu Glu Lys		
385	390	

<210> 43

<211> 393

<212> PRT

<213> Saprolegnia diclina

<400> 43

Met Cys Lys Gly Gln Ala Pro Ser Lys Ala Asp Val Phe His Ala Ala

1 5 10 15

Gly Tyr Arg Pro Val Ala Gly Thr Pro Glu Pro Leu Pro Leu Glu Pro

20	25	30
Pro Thr Ile Thr Leu Lys Asp Leu Arg Ala Ala Ile Pro Ala His Cys		
35	40	45
Phe Glu Arg Ser Ala Ala Thr Ser Phe Tyr His Leu Ala Lys Asn Leu		
50	55	60
Ala Ile Cys Ala Gly Val Phe Ala Val Gly Leu Lys Leu Ala Ala Ala		
65	70	75
Asp Leu Pro Leu Ala Ala Lys Leu Val Ala Trp Pro Ile Tyr Trp Phe		
85	90	95
Val Gln Gly Thr Tyr Phe Thr Gly Ile Trp Val Ile Ala His Glu Cys		
100	105	110
Gly His Gln Ala Phe Ser Ala Ser Glu Ile Leu Asn Asp Thr Val Gly		
115	120	125
Ile Ile Leu His Ser Leu Leu Phe Val Pro Tyr His Ser Trp Lys Ile		
130	135	140
Thr His Arg Arg His His Ser Asn Thr Gly Ser Cys Glu Asn Asp Glu		
145	150	155
Val Phe Thr Pro Thr Pro Arg Ser Val Val Glu Ala Lys His Asp His		
165	170	175
Ser Leu Leu Glu Glu Ser Pro Leu Tyr Asn Leu Tyr Gly Ile Val Met		
180	185	190
Met Leu Leu Val Gly Trp Met Pro Gly Tyr Leu Phe Phe Asn Ala Thr		
195	200	205
Gly Pro Thr Lys Tyr Ala Gly Leu Ala Lys Ser His Phe Asn Pro Tyr		
210	215	220
Ala Ala Phe Phe Leu Pro Lys Glu Arg Leu Ser Ile Trp Trp Ser Asp		
225	230	235
Leu Cys Phe Leu Ala Ala Leu Tyr Gly Phe Gly Tyr Gly Val Ser Val		
245	250	255
Phe Gly Leu Leu Asp Val Ala Arg His Tyr Ile Val Pro Tyr Leu Ile		
260	265	270
Cys Asn Ala Tyr Leu Val Leu Ile Thr Tyr Leu Gln His Thr Asp Thr		
275	280	285
Tyr Val Pro His Phe Arg Gly Asp Glu Trp Asn Trp Leu Arg Gly Ala		
290	295	300
Leu Cys Thr Val Asp Arg Ser Phe Gly Ala Trp Ile Asp Ser Ala Ile		
305	310	315
His His Ile Ala Asp Thr His Val Thr His His Ile Phe Ser Lys Thr		
325	330	335
Pro Phe Tyr His Ala Ile Glu Ala Thr Asp Ala Ile Thr Pro Leu Leu		
340	345	350
Gly Lys Tyr Tyr Leu Ile Asp Pro Thr Pro Ile Pro Leu Ala Leu Trp		
355	360	365
Arg Ser Phe Thr His Cys Lys Tyr Val Glu Asp Asp Gly Asn Val Val		
370	375	380
Phe Tyr Lys Arg Lys Leu Glu Glu Lys		
385	390	

<210> 44

<211> 359

<212> PRT

<213> Synechocystis sp.

<220>

<221> VARIANT

<222> (315)...(315)

<223> Xaa = Unknown or Other at position 315

<221> VARIANT

<222> (331)...(331)

<223> Xaa = Unknown or Other at position 331

<400> 44

Tyr	Phe	Phe	Leu	Asp	Val	Gly	Leu	Ile	Ala	Gly	Phe	Tyr	Ala	Leu	Ala
1					5				10						15
Ala	Tyr	Leu	Asp	Ser	Trp	Phe	Phe	Tyr	Pro	Ile	Phe	Trp	Leu	Ile	Gln
					20				25						30
Gly	Thr	Leu	Phe	Trp	Ser	Leu	Phe	Val	Val	Gly	His	Asp	Cys	Gly	His
					35				40						45
Gly	Ser	Phe	Ser	Lys	Ser	Lys	Thr	Leu	Asn	Asn	Trp	Ile	Gly	His	Leu
					50				55						60
Ser	His	Thr	Pro	Ile	Leu	Val	Pro	Tyr	His	Gly	Trp	Arg	Ile	Ser	His
					65				70			75			80
Arg	Thr	His	His	Ala	Asn	Thr	Gly	Asn	Ile	Asp	Thr	Asp	Glu	Ser	Trp
					85				90						95
Tyr	Pro	Val	Ser	Glu	Gln	Lys	Tyr	Asn	Gln	Met	Ala	Trp	Tyr	Glu	Lys
					100				105						110
Leu	Leu	Arg	Phe	Tyr	Leu	Pro	Leu	Ile	Ala	Tyr	Pro	Ile	Tyr	Leu	Phe
					115				120						125
Arg	Arg	Ser	Pro	Asn	Arg	Gln	Gly	Ser	His	Phe	Met	Pro	Gly	Ser	Pro
					130				135						140
Leu	Phe	Arg	Pro	Gly	Glu	Lys	Ala	Ala	Val	Leu	Thr	Ser	Thr	Phe	Ala
					145				150			155			160
Leu	Ala	Ala	Phe	Val	Gly	Phe	Leu	Gly	Phe	Leu	Thr	Trp	Gln	Phe	Gly
					165				170						175
Trp	Leu	Phe	Leu	Leu	Lys	Phe	Tyr	Val	Ala	Pro	Tyr	Leu	Val	Phe	Val
					180				185						190
Val	Trp	Leu	Asp	Leu	Val	Thr	Phe	Leu	His	His	Thr	Glu	Asp	Asn	Ile
					195				200						205
Pro	Trp	Tyr	Arg	Gly	Asp	Asp	Trp	Tyr	Phe	Leu	Lys	Gly	Ala	Leu	Ser
					210				215						220
Thr	Ile	Asp	Arg	Asp	Tyr	Gly	Phe	Ile	Asn	Pro	Ile	His	His	Asp	Ile
					225				230			235			240
Gly	Thr	His	Val	Ala	His	His	Ile	Phe	Ser	Asn	Met	Pro	His	Tyr	Lys
					245				250						255
Leu	Arg	Arg	Ala	Thr	Glu	Ala	Ile	Lys	Pro	Ile	Leu	Gly	Glu	Tyr	Tyr
					260				265						270
Arg	Tyr	Ser	Asp	Glu	Pro	Ile	Trp	Gln	Ala	Phe	Phe	Lys	Ser	Tyr	Trp
					275				280			285			
Ala	Cys	His	Phe	Val	Pro	Asn	Gln	Gly	Ser	Gly	Val	Tyr	Tyr	Gln	Ser
					290				295			300			
Pro	Ser	Asn	Gly	Gly	Tyr	Gln	Lys	Lys	Pro	Xaa	Leu	Ile	Leu	Ile	Glu
					305				310			315			320
Ser	Asn	Gln	His	Arg	Glu	Gly	Arg	Gln	Tyr	Xaa	Met	Val	Leu	Leu	Pro
					325				330						335
Ser	Asp	Arg	Leu	Met	Arg	Ser	Met	Glu	Glu	Val	Lys	Gln	Ser	His	Ser
					340				345						350
Lys	Arg	Ser	Ala	Leu	Asn	Gln									
					355										

<210> 45

<211> 358

<212> PRT

<213> Saprolegnia diclina

<400> 45
 Met Thr Glu Asp Lys Thr Lys Val Glu Phe Pro Thr Leu Thr Glu Leu
 1 5 10 15
 Lys His Ser Ile Pro Asn Ala Cys Phe Glu Ser Asn Leu Gly Leu Ser
 20 25 30
 Leu Tyr Tyr Thr Ala Arg Ala Ile Phe Asn Ala Ser Ala Ser Ala Ala
 35 40 45
 Leu Leu Tyr Ala Ala Arg Ser Thr Pro Phe Ile Ala Asp Asn Val Leu
 50 55 60
 Leu His Ala Leu Val Cys Ala Thr Tyr Ile Tyr Val Gln Gly Val Ile
 65 70 75 80
 Phe Trp Gly Phe Phe Thr Val Gly His Asp Cys Gly His Ser Ala Phe
 85 90 95
 Ser Arg Tyr His Ser Val Asn Phe Ile Ile Gly Cys Ile Met His Ser
 100 105 110
 Ala Ile Leu Thr Pro Phe Glu Ser Trp Arg Val Thr His Arg His His
 115 120 125
 His Lys Asn Thr Gly Asn Ile Asp Lys Asp Glu Ile Phe Tyr Pro His
 130 135 140
 Arg Ser Val Lys Asp Leu Gln Asp Val Arg Gln Trp Val Tyr Thr Leu
 145 150 155 160
 Gly Gly Ala Trp Phe Val Tyr Leu Lys Val Gly Tyr Ala Pro Arg Thr
 165 170 175
 Met Ser His Phe Asp Pro Trp Asp Pro Leu Leu Leu Arg Arg Ala Ser
 180 185 190
 Ala Val Ile Val Ser Leu Gly Val Trp Ala Ala Phe Phe Ala Ala Tyr
 195 200 205
 Ala Tyr Leu Thr Tyr Ser Leu Gly Phe Ala Val Met Gly Leu Tyr Tyr
 210 215 220
 Tyr Ala Pro Leu Phe Val Phe Ala Ser Phe Leu Val Ile Thr Thr Phe
 225 230 235 240
 Leu His His Asn Asp Glu Ala Thr Pro Trp Tyr Gly Asp Ser Glu Trp
 245 250 255
 Thr Tyr Val Lys Gly Asn Leu Ser Ser Val Asp Arg Ser Tyr Gly Ala
 260 265 270
 Phe Val Asp Asn Leu Ser His His Ile Gly Thr His Gln Val His His
 275 280 285
 Leu Phe Pro Ile Ile Pro His Tyr Lys Leu Asn Glu Ala Thr Lys His
 290 295 300
 Phe Ala Ala Ala Tyr Pro His Leu Val Arg Arg Asn Asp Glu Pro Ile
 305 310 315 320
 Ile Thr Ala Phe Phe Lys Thr Ala His Leu Phe Val Asn Tyr Gly Ala
 325 330 335
 Val Pro Glu Thr Ala Gln Ile Phe Thr Leu Lys Glu Ser Ala Ala Ala
 340 345 350
 Ala Lys Ala Lys Ser Asp
 355

<210> 46

<211> 409

<212> PRT

<213> Caenorhabditis elegans

<220>

<221> VARIANT

<222> (389)...(389)

<223> Xaa = Unknown or Other at position 389

<400> 46

Val	Thr	Gly	Gly	Asp	Val	Leu	Val	Asp	Ala	Arg	Ala	Ser	Leu	Glu	Glu	
1					5				10					15		
Lys	Glu	Ala	Pro	Arg	Asp	Val	Asn	Ala	Asn	Thr	Lys	Gln	Ala	Thr	Thr	
					20				25					30		
Glu	Glu	Pro	Arg	Ile	Gln	Leu	Pro	Thr	Val	Asp	Ala	Phe	Arg	Arg	Ala	
					35				40				45			
Ile	Pro	Ala	His	Cys	Phe	Glu	Arg	Asp	Leu	Val	Lys	Ser	Ile	Arg	Tyr	
					50				55				60			
Leu	Val	Gln	Asp	Phe	Ala	Ala	Leu	Thr	Ile	Leu	Tyr	Phe	Ala	Leu	Pro	
					65				70			75		80		
Ala	Phe	Glu	Tyr	Phe	Gly	Leu	Phe	Gly	Tyr	Leu	Val	Trp	Asn	Ile	Phe	
					85				90				95			
Met	Gly	Val	Phe	Gly	Phe	Ala	Leu	Phe	Val	Val	Gly	His	Asp	Cys	Leu	
					100				105				110			
His	Gly	Ser	Phe	Ser	Asp	Asn	Gln	Asn	Leu	Asn	Asp	Phe	Ile	Gly	His	
					115				120				125			
Ile	Ala	Phe	Ser	Pro	Leu	Phe	Ser	Pro	Tyr	Phe	Pro	Trp	Gln	Lys	Ser	
					130				135				140			
His	Lys	Leu	His	His	Ala	Phe	Thr	Asn	His	Ile	Asp	Lys	Asp	His	Gly	
					145				150			155		160		
His	Val	Trp	Ile	Gln	Asp	Lys	Asp	Trp	Trp	Glu	Ala	Met	Pro	Ser	Trp	Lys
					165				170				175			
Arg	Trp	Phe	Asn	Pro	Ile	Pro	Phe	Ser	Gly	Trp	Leu	Lys	Trp	Phe	Pro	
					180				185				190			
Val	Tyr	Thr	Leu	Phe	Gly	Phe	Cys	Asp	Gly	Ser	His	Phe	Trp	Pro	Tyr	
					195				200			205				
Ser	Ser	Leu	Phe	Val	Arg	Asn	Ser	Asp	Arg	Val	Gln	Cys	Val	Ile	Ser	
					210				215			220				
Gly	Ile	Cys	Cys	Val	Cys	Ala	Tyr	Ile	Ala	Leu	Thr	Ile	Ala	Gly		
					225				230			235		240		
Ser	Tyr	Ser	Asn	Trp	Phe	Trp	Tyr	Tyr	Trp	Val	Pro	Leu	Ser	Phe	Phe	
					245				250			255				
Gly	Leu	Met	Leu	Val	Ile	Val	Thr	Tyr	Leu	Gln	His	Val	Asp	Asp	Val	
					260				265			270				
Ala	Glu	Val	Tyr	Glu	Ala	Asp	Glu	Trp	Ser	Phe	Val	Arg	Gly	Gln	Thr	
					275				280			285				
Gln	Thr	Ile	Asp	Arg	Tyr	Tyr	Gly	Leu	Gly	Leu	Asp	Thr	Thr	Met	His	
					290				295			300				
His	Ile	Thr	Asp	Gly	His	Val	Ala	His	His	Phe	Phe	Asn	Lys	Ile	Pro	
					305				310			315		320		
His	Tyr	His	Leu	Ile	Glu	Ala	Tha	Gly	Gly	Val	Lys	Lys	Val	Leu	Glu	
					325				330			335				
Pro	Leu	Ser	Asp	Thr	Gln	Tyr	Gly	Tyr	Lys	Ser	Gln	Val	Asn	Tyr	Asp	
					340				345			350				
Phe	Phe	Ala	Arg	Phe	Leu	Trp	Phe	Asn	Tyr	Lys	Leu	Asp	Tyr	Leu	Val	
					355				360			365				
His	Lys	Thr	Ala	Gly	Ile	Met	Gln	Phe	Arg	Thr	Leu	Glu	Glu	Lys		
					370				375			380				
Ala	Lys	Ala	Lys	Xaa	Lys	Asn	Ile	Pro	Cys	Arg	Ser	Arg	Val	Gln	Gln	
					385				390			395		400		
Gln	Leu	Leu	Arg	Phe	His	Arg	Phe	Cys								
					405											

<210> 47

<211> 333
 <212> PRT
 <213> Saprolegnia diclina

<400> 47
 Met Cys Lys Gly Gln Ala Pro Ser Lys Ala Asp Val Phe His Ala Ala
 1 5 10 15
 Gly Tyr Arg Pro Val Ala Gly Thr Pro Glu Pro Leu Pro Leu Glu Pro
 20 25 30
 Pro Thr Ile Thr Leu Lys Asp Leu Arg Ala Ala Ile Pro Ala His Cys
 35 40 45
 Phe Glu Arg Ser Ala Ala Thr Ser Phe Tyr His Leu Ala Lys Asn Leu
 50 55 60
 Ala Ile Cys Ala Gly Val Phe Ala Val Gly Leu Lys Leu Ala Ala
 65 70 75 80
 Asp Leu Pro Leu Ala Ala Lys Leu Val Ala Trp Pro Ile Tyr Trp Phe
 85 90 95
 Val Gin Gly Thr Tyr Phe Thr Gly Ile Trp Val Ile Ala His Glu Cys
 100 105 110
 Gly His Gln Ala Phe Ser Ala Ser Glu Ile Leu Asn Asp Thr Val Gly
 115 120 125
 Ile Ile Leu His Ser Leu Leu Phe Val Pro Tyr His Ser Trp Lys Ile
 130 135 140
 Thr His Arg Arg His His Ser Asn Thr Gly Ser Cys Glu Asn Asp Glu
 145 150 155 160
 Val Phe Thr Pro Thr Pro Arg Ser Val Val Glu Ala Lys His Asp His
 165 170 175
 Ser Leu Leu Glu Ser Pro Leu Tyr Asn Leu Tyr Gly Ile Val Met
 180 185 190
 Met Leu Leu Val Gly Trp Met Pro Gly Tyr Leu Phe Phe Asn Ala Thr
 195 200 205
 Gly Pro Thr Lys Tyr Ala Gly Leu Ala Lys Ser His Phe Asn Pro Tyr
 210 215 220
 Ala Ala Phe Phe Leu Pro Lys Glu Arg Leu Ser Ile Trp Trp Ser Asp
 225 230 235 240
 Leu Cys Phe Leu Ala Ala Leu Tyr Gly Phe Gly Tyr Gly Val Ser Val
 245 250 255
 Phe Gly Leu Leu Asp Val Ala Arg His Tyr Ile Val Pro Tyr Leu Ile
 260 265 270
 Cys Asn Ala Tyr Leu Val Leu Ile Thr Tyr Leu Gln His Thr Asp Thr
 275 280 285
 Thr Pro Leu Leu Gly Lys Tyr Tyr Leu Ile Asp Pro Thr Pro Ile Pro
 290 295 300
 Leu Ala Leu Trp Arg Ser Phe Thr His Cys Lys Tyr Val Glu Asp Asp
 305 310 315 320
 Gly Asn Val Val Phe Tyr Lys Arg Lys Leu Glu Glu Lys
 325 330

<210> 48
 <211> 412
 <212> PRT
 <213> Gossypium hirsutum

<220>
 <221> VARIANT
 <222> (9)...(9)
 <223> Xaa = Unknown or Other at position 9

<221> VARIANT

<222> (403)...(403)

<223> Xaa = Unknown or Other at position 403

<400> 48

Leu	Arg	Val	Ser	Ser	Thr	Trp	Arg	Xaa	Thr	Ala	Phe	Phe	Lys	Ala	Ser
1										10				15	
Lys	Met	Gly	Ala	Gly	Gly	Arg	Met	Pro	Ile	Asp	Gly	Ile	Lys	Glu	Glu
													20	25	30
Asn	Arg	Gly	Ser	Val	Asn	Arg	Val	Pro	Ile	Glu	Lys	Pro	Pro	Phe	Thr
													35	40	45
Leu	Gly	Gln	Ile	Lys	Gln	Ala	Ile	Pro	Pro	His	Cys	Phe	Arg	Arg	Ser
													50	55	60
Leu	Leu	Arg	Ser	Phe	Ser	Tyr	Val	Val	His	Asp	Leu	Cys	Leu	Ala	Ser
65											70	75			80
Phe	Phe	Tyr	Tyr	Ile	Ala	Thr	Ser	Tyr	Phe	His	Phe	Leu	Pro	Gln	Pro
											85	90			95
Phe	Ser	Tyr	Ile	Ala	Trp	Pro	Val	Tyr	Trp	Val	Leu	Gln	Cys	Ile	
											100	105			110
Leu	Thr	Gly	Val	Trp	Val	Ile	Ala	His	Glu	Trp	Gly	His	His	Ala	Phe
											115	120			125
Arg	Asp	Tyr	Gln	Trp	Val	Asp	Asp	Thr	Val	Gly	Leu	Ile	Leu	His	Ser
											130	135			140
Ala	Leu	Leu	Val	Pro	Tyr	Phe	Ser	Trp	Lys	Ile	Ser	His	Arg	Arg	His
											145	150	155		160
His	Ser	Asn	Thr	Gly	Ser	Met	Glu	Arg	Asp	Glu	Val	Phe	Val	Pro	Lys
											165	170			175
Pro	Lys	Ser	Lys	Leu	Ser	Cys	Phe	Ala	Lys	Tyr	Leu	Asn	Asn	Pro	Pro
											180	185			190
Gly	Arg	Val	Leu	Ser	Leu	Val	Val	Thr	Leu	Thr	Leu	Gly	Trp	Pro	Met
											195	200			205
Tyr	Leu	Ala	Phe	Asn	Val	Ser	Gly	Arg	Tyr	Tyr	Asp	Arg	Leu	Ala	Ser
											210	215			220
His	Tyr	Asn	Pro	Tyr	Gly	Pro	Ile	Tyr	Ser	Asp	Arg	Glu	Arg	Leu	Gln
											225	230	235		240
Val	Tyr	Ile	Ser	Asp	Thr	Gly	Ile	Phe	Ala	Val	Ile	Tyr	Val	Leu	Tyr
											245		250		255
Lys	Ile	Ala	Ala	Thr	Lys	Gly	Leu	Ala	Trp	Leu	Leu	Cys	Thr	Tyr	Gly
											260	265			270
Val	Pro	Leu	Leu	Ile	Val	Asn	Ala	Phe	Leu	Val	Leu	Ile	Thr	Tyr	Leu
											275				285
Gln	His	Thr	His	Ser	Ala	Leu	Pro	His	Tyr	Asp	Ser	Ser	Glu	Trp	Asp
											290	295			300
Trp	Leu	Arg	Gly	Ala	Leu	Ser	Thr	Met	Asp	Arg	Asp	Phe	Gly	Val	Leu
											305	310	315		320
Asn	Lys	Val	Phe	His	Asn	Ile	Thr	Asp	Thr	His	Val	Ala	His	His	Leu
											325		330		335
Phe	Ser	Thr	Met	Pro	His	Tyr	His	Ala	Met	Glu	Ala	Thr	Lys	Ala	Ile
											340	345			350
Lys	Pro	Ile	Leu	Gly	Lys	Tyr	Tyr	Pro	Phe	Asp	Gly	Thr	Pro	Ile	Tyr
											355	360	365		
Lys	Ala	Met	Trp	Arg	Glu	Ala	Lys	Glu	Cys	Leu	Tyr	Val	Glu	Pro	Asp
											370	375	380		
Val	Gly	Gly	Gly	Gly	Gly	Ser	Lys	Gly	Val	Phe	Trp	Tyr	Arg	Asn	
											385	390	395		400
Lys	Phe	Xaa	Arg	Pro	Thr	Asn	Cys	Leu	Ile	Ala	Gly				

405

410

<210> 49
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Protein Motif 1 from Example 3

<400> 49
Thr Arg Ala Ala Ile Pro Lys His Cys Trp Val Lys
1 5 10

<210> 50
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Protein Motif 2 from Example 3

<400> 50
Ala Leu Phe Val Leu Gly His Asp Cys Gly His Gly Ser Phe Ser
1 5 10 15

<210> 51
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Protein Motif 3 from Example 3

<400> 51
Pro Tyr His Gly Trp Arg Ile Ser His Arg Thr His His Gln Asn
1 5 10 15

<210> 52
<211> 12
<212> PRT
<213> Artificial Sequence

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<221> VARIANT
<222> (5)...(5)
<223> Xaa = D or H at position 5

<221> VARIANT
<222> (7)...(7)
<223> Xaa = D or Y at position 7

<400> 52
Gly Ser His Phe Xaa Pro Xaa Ser Asp Leu Phe Val
1 5 10

<210> 53
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
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<221> VARIANT
<222> (3)...(3)
<223> Xaa = Y or F at position 3

<221> VARIANT
<222> (4)...(4)
<223> Xaa = L or V at position 4

<221> VARIANT
<222> (11)...(11)
<223> Xaa = L or I at position 11

<400> 53
Trp Ser Xaa Xaa Arg Gly Gly Leu Thr Thr Xaa Asp Arg
1 5 10

<210> 54
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Protein Motif 6 from Example 3

<400> 54
His His Asp Ile Gly Thr His Val Ile His His Leu Phe Pro Gln
1 5 10 15

<210> 55
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<221> VARIANT
<222> (2)...(2)
<223> Xaa = L or F at position 2

<221> VARIANT
<222> (5)...(5)
<223> Xaa = Q or K at position 5

<221> VARIANT
<222> (12)...(12)
<223> Xaa = V or I at position 12

<400> 55
His Xaa Phe Pro Xaa Ile Pro His Tyr His Leu Xaa Glu Ala Thr
1 5 10 15

<210> 56
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<221> VARIANT
<222> (3)...(3)
<223> Xaa = A or I at position 3

<221> VARIANT
<222> (6)...(6)
<223> Xaa = L or F at position 6

<400> 56
His Val Xaa His His Xaa Phe Pro Gln Ile Pro His Tyr His Leu
1 5 10 15

<210> 57
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
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<221> VARIANT
<222> (2)...(2)
<223> Xaa = N or E at position 2

<221> VARIANT
<222> (10)...(10)
<223> Xaa = D or E at position 10

<221> VARIANT
<222> (11)...(11)
<223> Xaa = A or C at position 11

<400> 57
Pro Xaa Phe Thr Ile Lys Glu Ile Arg Xaa Xaa Ile Pro Ala His Cys
1 5 10 15
Phe

<210> 58
<211> 16
<212> PRT
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<220>
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<221> VARIANT
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<223> Xaa = H or F at position 3

<221> VARIANT
<222> (11)...(11)
<223> Xaa = V or Y at position 11

<221> VARIANT
<222> (13)...(13)
<223> Xaa = I or L at position 13

<221> VARIANT
<222> (16)...(16)
<223> Xaa = A or L at position 16

<400> 58
Met Pro Xaa Tyr His Ala Glu Glu Ala Thr Xaa His Xaa Lys Lys Xaa
1 5 10 15

<210> 59
<211> 15
<212> PRT
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<220>
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<221> VARIANT
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<223> Xaa = L or V at position 2

<221> VARIANT
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<223> Xaa = A or I at position 5

<221> VARIANT
<222> (6)...(6)
<223> Xaa = C or M or A at position 6

<221> VARIANT
<222> (9)...(9)
<223> Xaa = V or I at position 9

<221> VARIANT
<222> (11)...(11)
<223> Xaa = L or G or C at position 11

<400> 59
Pro Xaa Tyr Trp Xaa Xaa Gln Gly Xaa Val Xaa Thr Gly Val Trp
1 5 10 15

<210> 60
<211> 15
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<213> Artificial Sequence

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<223> Protein Motif 4 from Example 7

<221> VARIANT

<222> (6)...(6)

<223> Xaa = L or F at position 6

<221> VARIANT

<222> (9)...(9)

<223> Xaa = T or Q at position 9

<400> 60

His Val Ala His His Xaa Phe Ser Xaa Met Pro His Tyr His Ala

1

5

10

15